

What is claimed is:

1. A method of fabricating a semiconductor device including an interconnection, said method comprising:

forming a metal film stack to cover a
5 substrate; said film stack including:

a lower refractory metal film over said substrate,

a lower protective layer of a first compound including metal disposed on an upper
10 surface of said lower refractory metal film,

a core metal film of said metal on an upper surface of said lower protective layer,

an upper protective layer of a second compound including said metal disposed on an
15 upper surface of said core metal film, and

an upper refractory metal film disposed on an upper surface of said upper protective layer;

patterning said metal film stack; and

20 forming a side protective layer of a third compound including said metal on a side of said patterned core metal film.

2. The method according to claim 1, wherein at least one of said first, second, and third compounds is oxide of said metal.

3. The method according to claim 1, wherein at least one of said first, second, and third compounds is nitride of said metal.

4. The method according to claim 1, wherein at least one of said first, second, and third compounds is oxynitride of said metal.

5. The method according to claim 1, wherein said metal is selected from the group consisting of aluminum and aluminum alloy, and

wherein said first, second, and third
5 compounds are selected from the group consisting of oxide, nitride, and oxynitride of said metal.

6. The method according to claim 1, wherein said metal is selected from the group consisting of copper, silver, and an alloy thereof, and

wherein said first, second, and third
5 compounds are selected from the group consisting of nitride, and oxynitride of said metal.

7. The method according to claim 1, wherein said patterning includes:

forming a resist pattern on said metal film stack, and

5 etching said metal film stack using said
resist pattern as a mask, and

 wherein said forming said side protective
layer is implemented before said resist pattern
is stripped off.

8. The method according to claim 1, wherein
said patterning includes:

 forming a resist pattern on said metal film
stack,

5 etching said metal film stack using said
resist pattern as a mask, and

 stripping off at least a portion of said
resist pattern, and

 wherein said forming said side protective
10 layer is implemented after said stripping off.

9. The method according to claim 1, further
comprising:

 forming a semiconductor film stack to cover
said substrate; said semiconductor film stack
5 including a semiconductor layer and a heavily
doped semiconductor layer disposed on an upper
surface of said semiconductor layer, and said
metal film stack being patterned so that said
patterned metal film stack overlaps said

10 semiconductor film stack;

patterning said semiconductor film stack using said patterned film stack as a mask.

10. The method according to claim 9, wherein said patterning said semiconductor film stack is achieved by using etchant including fluorine.

11. The method according to claim 10, wherein said etchant further includes chlorine.

12. The method according to claim 1, further comprising:

forming a semiconductor film stack to cover said substrate; said semiconductor film stack
5 including a semiconductor layer and a heavily doped semiconductor layer disposed on an upper surface of said semiconductor layer, and

patterning said semiconductor film stack, wherein said patterning said metal film
10 stack includes:

forming a resist pattern on said metal film stack,

etching said metal film stack using said resist pattern as a mask so that said patterned
15 metal film stack overlaps said semiconductor film stack, and

wherein said patterning said semiconductor

film stack is achieved by using said resist pattern as a mask.

13. The method according to claim 12, wherein said patterning said semiconductor film stack is achieved by using etchant including fluorine.

14. The method according to claim 13, wherein said etchant further includes chlorine.